C L A I M S

1. A print control apparatus which transmits a printing job including printing data to a specified image forming apparatus through a communications medium, and controls the printing data to be printed by the specified image forming apparatus, comprising:

printing data encryption means for encrypting the printing data in a specified encrypting method in printing the printing job;

obtaining means for obtaining information about a destination for the image forming apparatus; and

decryption means for decrypting information about the destination obtained by said obtaining means.

2. The print control apparatus according to claim 1, further comprising:

feature amount computation means for computing a feature amount from the printing data; and

printing job transmission means for including the feature amount computed by said feature amount computation means in the printing job and transmitting the feature amount to the specified image forming apparatus through the communications medium.

3. The print control apparatus according to claim 1, wherein

the information about the destination obtained by said obtaining means is a port or a uniform resource identifier (URI) for printing.

4. The print control apparatus according to claim 1, wherein

said printing data encryption means functions as public key encryption means for performing encryption based on a public key cryptosystem, and encrypts the printing data using a public key of the image forming apparatus specified for printing the printing data based on the public key cryptosystem.

5. The print control apparatus according to claim 1, further comprising:

secret key generation means for generating a secret key commonly used by the image forming apparatus specified for printing the printing data;

secret key encryption means for encrypting the secret key generated by said secret key generation means; and

printing job transmission means for including the secret key encrypted by said secret key encryption means in the printing job, and transmitting the key to the communications medium,

wherein:

said printing data encryption means functions as common key encryption means for performing encryption based on a conventional encryption system, and encrypts the printing data using the secret key generated by said secret key generation means based on the conventional encryption system; and

said secret key encryption means functions as public key encryption means for performing encrypt based on the public key cryptosystem, performs the encryption based on the public key cryptosystem, and encrypts the secret key using a public key of the image forming apparatus specified for printing the printing data.

6. The print control apparatus according to claim 2, further comprising

digital signature generation means for generating a digital signature by performing encryption based on a public key cryptosystem on the feature amount computed by said feature amount computation means and encrypting the feature amount using a private key of said digital signature generation means, wherein

said printing job transmission means includes in the printing job the digital signature generated by said digital signature generation means instead of

the feature amount computed by said feature amount computation means, and transmits the printing job to the communications medium.

7. The print control apparatus according to claim 1, further comprising:

image forming apparatus selection means for selecting an image forming apparatus for printing the printing data from the group consisting of a plurality of image forming apparatuses by issuing an inquiry to an image forming apparatus management server for managing information about the image forming apparatuses; and

image forming apparatus information obtaining means for obtaining information about the image forming apparatus specified for printing the printing data from the image forming apparatus management server.

8. The print control apparatus according to claim 7, wherein:

said image forming apparatus information obtaining means obtains an encryption key and an address of the image forming apparatus specified for printing the printing data from the image forming apparatus management server; and

said printing data encryption means encrypts

the printing data using the key of the image forming apparatus obtained by said image forming apparatus information obtaining means, and transmits the encrypted printing data directly to the address of the image forming apparatus obtained by said image forming apparatus information obtaining means.

9. The print control apparatus according to claim 7, wherein

said printing data encryption means obtains an encryption key of the image forming apparatus management server, encrypts the printing data, and transmits the encrypted printing data to the image forming apparatus management server.

10. The print control apparatus according to claim 7, wherein

said image forming apparatus selection means selects from the group consisting of a plurality of image forming apparatuses a corresponding image forming apparatus by said image forming apparatus information obtaining means transmitting to the image forming apparatus management server a necessary condition for said image forming apparatus selection means selecting a corresponding image forming apparatus from the group consisting of a plurality of image forming apparatuses.

11. The print control apparatus according to claim 7, wherein

the image forming apparatus management server roughly selects corresponding image forming apparatuses from the group consisting of a plurality of image forming apparatuses by said image forming apparatus information obtaining means transmitting to the server a necessary condition for the image forming apparatus management server roughly selecting the corresponding image forming apparatuses from the group consisting of a plurality of image forming apparatuses, and the image forming apparatus management server which has roughly selected the corresponding image forming apparatuses from the group of the plurality of image forming apparatuses interactively communicates with said image forming apparatus selection means, thereby selecting the image forming apparatus for printing the printing data from the group of the plurality of image forming apparatuses.

12. An image forming apparatus which prints encrypted printing data contained in a printing job received through a communications medium, comprising:

printing data decryption means for decrypting the printing data in a predetermined decrypting method for the encrypted printing data;

feature amount obtaining means for obtaining a feature amount from the received printing job;

feature amount computation means for computing a feature amount from the printing data decrypted by said printing data decryption means;

transfer means for encrypting and transferring information about a destination corresponding to an image forming apparatus; and

printing data confirmation means for comparing the feature amount computed by said feature amount computation means with the feature amount obtained by said feature amount obtaining means, and confirming that the encrypted and received printing data has not been destroyed or falsified if a comparison result indicates matching feature amounts.

13. The image forming apparatus according to claim 12, wherein

said printing data decryption means functions as public key decryption means for performing decryption based on a public key cryptosystem, performs the decryption to decrypt the encrypted and received printing data using a private key of said printing data decryption means, and obtains the printing data.

14. The image forming apparatus according to

claim 12, further comprising:

secret key retrieval means for retrieving an encrypted secret key from the received printing job; and

secret key obtaining means for performing decryption based on a public key cryptosystem on the encrypted secret key retrieved from said secret key retrieval means, decrypting the encrypted secret key using a private key of said secret key obtaining means, and obtaining the secret key of the printing job, wherein

said printing data decryption means functions as common key decryption means for performing decryption based on a conventional encryption system, applies the conventional encryption system to decrypt the encrypted printing data using the secret key, and obtains printing data.

15. The image forming apparatus according to claim 12, further comprising

digital signature retrieval means for retrieving a digital signature from the received printing job, wherein:

said feature amount obtaining means obtains a feature amount by decrypting the digital signature retrieved by said digital signature retrieval means based on a public key decrypting method using a

public key of a source of the printing job;

said printing data confirmation means compares the feature amount computed from the printing data decrypted by said printing data decryption means with the feature amount obtained by said feature amount obtaining means, confirms that the feature amounts match each other, thereby confirming that the source is a specified image forming apparatus driver and that the encrypted and received printing data has not been destroyed or falsified.

16. An image forming apparatus management server which manages information about an image forming apparatus connected through a communications medium, comprising:

information holding means for holding a list of information including a setting position, a capability, and an encryption key of each available image forming apparatus connected through the communications medium;

image forming apparatus selection means for referring to the list of information held by said information holding means in response to an inquiry from a print control apparatus which controls printing of the image forming apparatus, and selects an appropriate image forming apparatus for printing data from the group consisting of a plurality of

image forming apparatuses;

image forming apparatus information obtaining means for obtaining in response to an inquiry from the print control apparatus an encryption key and address information about the image forming apparatus selected by said image forming apparatus selection means; and

image forming apparatus information transmission means for decrypting the encrypted printing data received from the print control apparatus using the key held by said information holding means, re-encrypting the decrypted printing data using the key of the image forming apparatus obtained by said image forming apparatus information obtaining means, and transmitting the re-encrypted printing data to the address obtained by said image forming apparatus information obtaining means.

17. A print control method for transmitting a printing job containing printing data to a specified image forming apparatus through a communications medium to control the printing data to be printed by the specified image forming apparatus, comprising the step of

performing printing data encryption process for encrypting the printing data in an encrypting method in which the image forming apparatus specified for

printing the printing data can decrypt the data, obtaining information about a destination of the image forming apparatus, and decrypting the obtained information about the destination.

18. The print control method according to claim 17, further comprising a feature amount computing process of computing a feature amount from the printing data, and a printing job transmitting process of including the feature amount computed in said feature amount computing process in the printing job and transmitting the feature amount to the specified image forming apparatus through the communications medium.

19. The print control method according to claim 18, wherein

said printing data encryption process performs a public key encrypting process which is encryption based on a public key cryptosystem using a public key of the image forming apparatus specified for printing the printing data, and encrypts the printing data.

20. The print control method according to claim 17, further comprising:

a secret key generating process of generating a secret key commonly used by the image forming

apparatus specified for printing the printing data;

a secret key encrypting process for encrypting the secret key generated in said secret key generating process; and

a printing job transmitting process for including the secret key encrypted in said secret key encrypting process in the printing job, and transmitting the key to the communications medium, wherein:

said printing data encryption process performs a common key encrypting process which is encryption based on a conventional encryption system using the secret key generated in said secret key generating process, and encrypts the printing data; and

said secret key encrypting process performs a public key encrypting process which is encryption based on a public key cryptosystem using a public key of the image forming apparatus specified for printing the printing data, and encrypts the secret key.

21. The print control method according to claim 18, further comprising

a digital signature generating process of performing encryption based on a public key cryptosystem using a private key on the feature amount computed in said feature amount computing process and encrypting the feature amount, thereby

generating a digital signature, wherein

said printing job transmitting process includes in the printing job the digital signature generated in said digital signature generating process instead of the feature amount computed in said feature amount computing process, and transmits the printing job to the communications medium.

22. The print control method according to claim 17, further comprising:

an image forming apparatus selecting process of selecting an image forming apparatus for printing the printing data from the group consisting of a plurality of image forming apparatuses by issuing an inquiry to an image forming apparatus management server for managing information about the image forming apparatuses; and

an image forming apparatus information obtaining process of obtaining information about the image forming apparatus specified for printing the printing data from the image forming apparatus management server.

23. The print control method according to claim 23, wherein:

said image forming apparatus information obtaining process obtains an encryption key and an

address of the image forming apparatus specified for printing the printing data from the image forming apparatus management server; and

said printing data encrypting process encrypts the printing data using the key of the image forming apparatus obtained by said image forming apparatus information obtaining process, and transmits the encrypted printing data directly to the address of the image forming apparatus obtained in said image forming apparatus information obtaining process.

24. The print control method according to claim 22, wherein

said printing data encrypting process obtains an encryption key of the image forming apparatus management server, encrypts the printing data, and transmits the encrypted printing data to the image forming apparatus management server.

25. The print control method according to claim 22, wherein

said image forming apparatus selecting process selects from the group consisting of a plurality of image forming apparatuses a corresponding image forming apparatus by said image forming apparatus information obtaining process of transmitting to the image forming apparatus management server a necessary

condition for said image forming apparatus selecting process of selecting a corresponding image forming apparatus from the group consisting of a plurality of image forming apparatuses.

26. The print control method according to claim 22, wherein

the image forming apparatus management server roughly selects corresponding image forming apparatuses from the group consisting of a plurality of image forming apparatuses by said image forming apparatus information obtaining process of transmitting to the server a necessary condition for the image forming apparatus management server roughly selecting the corresponding image forming apparatuses from the group consisting of a plurality of image forming apparatuses, and the image forming apparatus management server which has roughly selected the corresponding image forming apparatuses from the group of the plurality of image forming apparatuses interactively communicates with said image forming apparatus selecting process, thereby selecting the image forming apparatus for printing the printing data from the group of the plurality of image forming apparatuses.

27. The print control method according to

claim 25, further comprising:

a feature amount obtaining process of obtaining a feature amount from the received printing job;

a feature amount computing process of computing a feature amount from the printing data decrypted in said printing data decrypting process;

a transfer process of encrypting and transferring information about a destination corresponding to an image forming apparatus; and

a printing data confirming process of comparing the feature amount computed in said feature amount computing process with the feature amount obtained by said feature amount obtaining process, and confirming that the encrypted and received printing data has not been destroyed or falsified if a comparison result indicates matching feature amounts.

28. The print control method according to claim 26, wherein

said printing data decrypting process functions as a public key decrypting process for performing decryption based on a public key cryptosystem, performs the decryption to decrypt the encrypted and received printing data using a private key, and obtains the printing data.

29. The print control method according to

claim 27, further comprising:

a secret key retrieving process for retrieving an encrypted secret key from the received printing job; and

a secret key obtaining process of performing decryption based on a public key decrypting method on the encrypted secret key retrieved from said secret key retrieving process, decrypting the encrypted secret key using a private key of said private key obtaining process, and obtaining the secret key of the printing job, wherein

said printing data decrypting process functions as a common key decrypting process of performing decryption based on a conventional encryption system, decrypts the encrypted printing data using the secret key, and obtains printing data.

30. The print control method according to claim 27, further comprising

a digital signature retrieving process of retrieving a digital signature from the received printing job, wherein:

said feature amount obtaining process obtains a feature amount by decrypting the digital signature retrieved in said digital signature retrieving process based on a public key decrypting method using a public key of a source of the printing job;

said printing data confirming process compares the feature amount computed from the printing data decrypted in said printing data decrypting process with the feature amount obtained in said feature amount obtaining process, confirms that the feature amounts match each other, thereby confirming that the source is a specified image forming apparatus driver and that the encrypted and received printing data has not been destroyed or falsified.

31. A print control method comprising:

an information holding process of holding a list of information including a setting position, a capability, and an encryption key of each available image forming apparatus connected through the communications medium;

a selecting process of referring to the list of information held in said information holding process in response to an inquiry from a print control apparatus which controls printing of the image forming apparatus, and selects an appropriate image forming apparatus for printing data from the group consisting of a plurality of image forming apparatuses;

an information obtaining process of obtaining in response to an inquiry from the print control apparatus an encryption key and address information

about the image forming apparatus selected in said image forming apparatus selecting process; and

an image forming apparatus information transmitting process of decrypting the encrypted printing data received from the print control apparatus using the key held in said information holding process, re-encrypting the decrypted printing data using the key of the image forming apparatus obtained in said information obtaining process, and transmitting the re-encrypted printing data to the address obtained in said information obtaining process.

32. A computer-readable storage medium storing a computer program to direct a computer to perform:

a printing data encrypting process of encrypting the printing data in an encrypting method in which an image forming apparatus specified for printing the printing data can decrypt the data when a printing job containing printing data is transmitted to a specified image forming apparatus through a communications medium to control the printing data to be printed by the specified image forming apparatus;

an obtaining process of indicating information about a destination for the image forming apparatus; and

a decrypting process of decrypting the obtained information about the destination.

33. A print control apparatus which transmits a printing job including printing data to a specified image forming apparatus through a communications medium, and controls the printing data to be printed by the specified image forming apparatus, comprising:

a printing data encryption unit, which encrypts the printing data in a specified encrypting method in printing the printing job;

an obtaining unit, which obtains information about a destination for the image forming apparatus; and

a decryption unit, which decrypts information about the destination obtained by said obtaining unit.